Dell Networking

Product Portfolio Guide

Data center, campus LAN and wireless

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Dell Networking
Product Portfolio Guide

Data Center Top-of-Rack and Fabric Switches

Speed	Model	Overview	Capacity and ports		Data Center	Core	Aggregation / Layer 3	Top-of-Rack	Campus LAN	Aggregation / Layer 3	Edge / Layer 2	Branch office	Small office	Features	PoE / PoE+	Stacking (maximum stack)	Open Automation[1]	iSCSI optimization[2]	Hot-swap power	Redundant power	Airflow option[3, 4, 5, or 6]	Warranty[7]
10/40 GbE	Z9500	Massively scalable, 10/40GbE switch delivers high-density andhigh performance in a 3RU footprint.	10.4 Tbps	132 ports of 40GbE or 528 ports of 10Gbe (breakout). Licensing available for 36, 84 or 132 port skus.		●	●								-	✓		✓	✓	*5	
	Z9000	Massively scalable switch for cloud and virtualized data centers. (OpenFlow™ compliant)	2.5 Tbps	32 ports 40GbE QSFP+ or 128 ports 10GbE SFP+		●	●								-	✓		✓	✓	*3	1 yr
	S6000 ⊕	High-density switch with advanced virtualization and automation features for ToR.	2.5 Tbps	32 ports 40GbE QSFP+ or 96 ports 10GbE SFP+ with eight 40GbE ports			●	●							-	✓	✓	✓	✓	*3	1 yr
1/10/40 GbE and 8Gb FC	S5000	Modular converged fabric switch provides Ethernet, Fibre Channel, and FCoE connections at the Top-of-Rack for true flexibility.	1.28 Tbps	Up to 48 ports inserted as 12 port modules and four fixed 40GbE ports. Four slots and two modules: • 12 port 1/10GbE • 12 port 10GbE or 2/4/8Gb Fibre Channel			●	●							6	✓	✓	✓	✓	*3	1 yr
1/10/40 GbE	S4820T or S4810 ⊕	High-performance top-of-rack switches designed to deliver non-blocking throughput for dense traffic environments. (S4810 is OpenFlow compliant)	1.28 Tbps	48 ports 10GBase-T or 48 ports SFP+. Both switches include four 40GbE QSFP+ ports that expand to 64 total 10G ports using breakout cables.			●	●							6	✓	✓	✓	✓	*3	1 yr
1/10 GbE	S60	Deep buffer switch with 1.25GB memory to smooth out traffic spikes associated with high-demand apps.	176 Gbps	44 ports Base-T with four SFP ports and two expansion slots (Choose: SFP+ or 12/24Gb stacking)				●							12	✓	✓	✓	✓	*3	5 yr
	S55	High-capacity, low latency, switch optimized for top-of-rack deployments.	176 Gbps	44 ports Base-T with four SFP ports and two expansion slots (Choose SFP+ or 12Gb stacking)				●							12	✓	✓	✓	✓	*3	5 yr

Campus LAN Aggregation and Access Switches

10/40 GbE	N4000	Scalable 10GbE Layer 3 switch with 40GbE port capabilities.	1.2 Tbps	Up to 64 line-rate 10GbE ports per switch and up to 672 10GbE ports in a 12-unit stack with user port stacking at up to 320 Gbps. Hot swap expansion module supporting dual QSFP+ (8 x 10GbE), Quad 10GBaseT, and Quad SFP+						●	●					12		✓	✓	✓	*5	Life
1/10 GbE	N3000	Scalable GbE Layer 3 switch with energy-efficient design and PoE+capabilities.	260 Gbps	Up to 48 line-rate 1GbE ports per switch and up to 624 1GbE ports in a 12-unit stack. Hot swap expansion module supporting dual SFP+ and dual 10GBaseT. Up to 48 ports of PoE+.						●	●	●			P+	12		✓	✓	✓	*5	Life
	N2000	Scalable GbE Layer 2 switch with energy-efficient design and PoE+ capabilities.	220 Gbps	Up to 48 line-rate 1GbE ports per switch and up to 600 1GbE ports in a twelve-unit stack. Up to 48 ports of PoE+.							●	●	●		P+	12				E	*5	Life
1 GbE	2800 Series	Quiet and simple to manage for small offices connecting PCs and peripherals using Gigabit speed.	16-96 Gbps	8-48 ports with SFP combo ports (varies by model)							●	●	●								*5 or *6	Life
100 Mb	3500 Series	Entry-level switch where full management capabilities and PoE are priority over speed.	13/18 Gbps	24/48 ports Base-T with two SFP copper or fiber uplinks							●	●	●		P	8				E	*5	Life

⊕ Open Networking versions of the S6000 and S4810 swtiches are available.

● Recommended deployment

* (1) Open Automation is an integrated software suite of advanced network management tools to automate data center processes and hypervisor switch communications. See page 5 for details. Z9000 has partial Open Automation capabilities: Bare Metal Provisioning and Smart Scripting only. (2) iSCSI optimization automatically configures QoS policies for Dell storage arrays. (3) Air flow direction (front to rear or rear to front) must be selected upon ordering. (4) Side-to-side airflow. (5) Air flow moves from front ports and side towards back. (6) Fan less models 2808 and 2816. Power-over-Ethernet (PoE/PoE+) available on select models. (7) Details pertaining to other Limited Hardware Warranties, visit **Dell.com/Warranty**. Life = Lifetime Warranty (hardware repair or replacement) for as long as you own the product. Info at **Dell.com/LifetimeWarranty.**

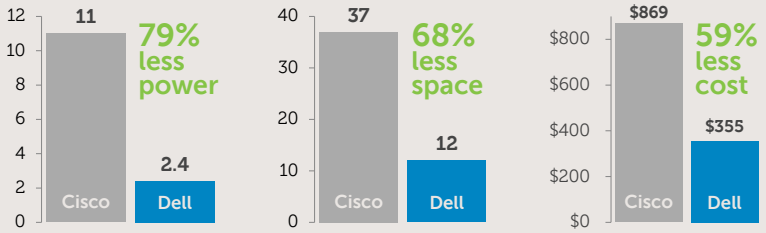
Active Fabric

Cost-effective fabrics for cloud and virtualized data centers of any size

Active Fabric is family of high-performance, cost-effective networking solutions to interconnect server, storage and software elements in cloud and virtualized data centers. Active Fabric solutions comprise low-power, high-throughput 10GbE and 40GbE switching platforms equipped with fully-featured Layer 2/3 multi-path fabric technology, DCB options for SAN/LAN convergence, and software-defined networking programmability.

Active Fabric Solutions
(Two or four node configurations combined with top-of-rack and blade I/O elements, and unified via Active Fabric Manager)
- **10G Active Fabric**: DCB-enabled configurations using S4810 systems
- **10G Active Fabric (converged)**: DCB and FC using the S5000
- **40G Active Fabric**: Configurations using Z9000 or S6000 systems
- **Active Fabric Manager**: Easy-to-use all-in-one software for fabric configuration, deployment, management, and monitoring.
- **Active Fabric Controller**: Simple and secure network functionality depoloyment in cloud/XaaS environments.

Redefining fabric economics



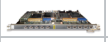
Recent internal analysis demonstrated that Dell Active Fabric architectures are more cost-effective and space-saving compared to the traditional modular Cisco Nexus chassis. The Active Fabric design delivers the same throughput density, saving up to 79% less power, up to 68% less space, and up to 59% less costs overall. (Chart shows one Cisco Nexus 7010 chassis with five F248XP line cards combined with eight Nexus 5596 switches for a total of 384 ports of 10GbE compared to eight Dell S4810 switches and two Dell Z9000 switches providing the same exact throughput capacity.)

Data Center and Campus Chassis Switches

High-density 1, 10 and 40 Gigabit chassis

Deployment	Capacity and ports	Model	Line cards
Data center core and aggregation	3.5 Tbps, 560 ports 10 GbE (140*), 1,260 ports GbE	E1200i	14
	1.75 Tbps, 280 ports 10 GbE (70*), 630 ports GbE	E600i	7
Data center or campus LAN aggregation and access	1.536 Tbps, 64 ports 10 GbE, 384 ports GbE	C7008	8
	768 Gbps, 32 ports 10 GbE, 192 ports GbE	C7004	4

*Maximum ports at line-rate speed.

Best selling line cards (E-Series)		Best selling line cards (C-Series)	
10 GbE SFP+ (10 or 40 ports)		10 GbE SFP+ or XFP (8 ports)	
1 GbE SFP (50 ports)		10/100/1000 Base-T with PoE (48 ports)	
10/100/1000 Base-T (90 ports)		FlexMedia card - 10/100/1000 Base-T with PoE (36 ports), 1 GbE (8 ports) and 10 GbE (2 ports)	

More line card options for both E and C Series chassis available.

C-Series E-Series

The Dell C-Series and E-Series chassis switches provide flexible, high-density 1/10GbE connectivity for data centers and enterprise LANs. The E-Series is ideal for cost-effective, collapsed-core designs and large-scale aggregation deployments. The C-Series is well suited for resilient campus LAN aggregation, wiring closet access and data center connectivity. The C-Series also supports 40GbE and Power-over-Ethernet+ for high-power peripherals such as WLAN access points, VoIP phones and security cameras.

Blade Interconnects

Transforming your Dell M1000e blade server enclosure

Capacity and ports	Model
1/10/40 GbE with iSCSI/FCoE transit (56 ports with two FlexIO modules)	MXL
1/10 GbE with iSCSI/FCoE transit (48 ports with two FlexIO modules)	PowerEdge M I/O aggregator
1/10 GbE with iSCSI/FCoE transit (24 ports with one FlexIO module)	M8024-k
10 GbE (24 ports) and 8 Gbps FC (4 ports)	M8428-k
1/10 GbE (48 ports)	M6348
1/10 GbE (20 ports & two FlexIO modules)	M6220
8/16 Gbps Fibre Channel (12 or 24 ports)	M6505

Represents converged networking capability with iSCSI or FCoE.
Find more blade interconnects, HBAs, and NICs on dell.com

Fibre Channel

Leading connectivity options for your SAN

Capacity and ports*	Model
8/16 Gbps, (48, 72 or 96 ports)	Brocade 6520
8/16 Gbps, (24, 36 or 48 ports)	Brocade 6510
8/16 Gbps, (12 or 24 ports)	Brocade 6505
4/8 Gbps, (8, 16, or 24 ports)	Brocade 300
Modular, 16 Gbps, (192 or 384 ports)	DCX 8510

*All switches support multi-speeds. For example, 16Gb also supports slower 2, 4 or 8Gbps.

*New Wireless products may have been introduced since the last revision and will be featured in the W-Series Quick Reference Guide

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Controller-Based Wireless Networks

The Dell W-Series controller-based network is ideal for organizations that seek maximum security, functionality and centralized management features. This architecture can enforce policies and security from one console and meets stringent government and military encryption certifications. Controller-based platforms can also serve as a termination point for your Virtual Private Network.

Access Points

Overview	Models
Enterprise-level, 2x2 MIMO, dual radio (5GHz: 876Mbps, 2.4GHz: 450Mbps)	W-AP204/W-AP205
High-performance, 3x3 MIMO, dual radio (5GHz: 1.3Gbps, 2.4GHz: 450Mbps)	W-AP214/W-AP215
Latest Gigabit wireless 802.11ac, 3x3 MIMO, dual radio (5GHz: 1.3Gbps, 2.4GHz: 600Mbps)	W-AP224*/W-AP225
	W-AP274/W-AP275 ●
High-performance, 3x3 MIMO, dual radio (450Mbps per radio)	W-AP134*/W-AP135
	W-AP114*/W-AP115
Mainstream, 2x2 MIMO, dual radio (300Mbps per radio)	W-AP104*/W-AP105
	W-AP175*● ϟ (Choose AC or PoE)
Entry-level, 2x2 MIMO, dual radio (300Mbps per radio)	W-AP103
Entry-level, 2x2 MIMO, dual radio (300Mbps per radio)	W-AP103H ⊕

⊕ **Wired + wireless model** includes four additional Ethernet ports to connect other devices or peripherals on the network. Ideal for hotels, offices, classrooms, dorms, hospitals and retail environments that require multiple connections in one device.

ϟ W-AP175AC model supplies PoE output (802.3af) to connected devices.

● Outdoor model

Controllers

Deployment	Model	Max users	Max APs	Firewall throughput
Campus and branch	W-7030	4,096	64	8Gbps
	W-7010	2,048	32	4Gbps
	W-7005	1,024	16	2Gbps
High density headquarters or large campus	W-7240	32,768	2,048	40Gbps
	W-7220	24,576	1,024	40Gbps
	W-7210	16,384	512	20Gbps
Medium to large enterprise	W-3600	4,096	128	4Gbps
	W-3400	4,096	64	4Gbps
	W-3200	2,048	32	3Gbps
Small office or branch office	W-650	32,768	16	2Gbps

Optional controller functionality
License and activate these modules or try them free for 90 days

Wireless Intrusion Protection (WIP) - Safeguard against wireless security threats, provide visibility into sources of RF interference, and eliminate the need for separate RF sensors and security appliances.

Policy Enforcement Firewall (PEF) - Provide identity-based controls to enforce application-layer security, prioritization, traffic forwarding, and network performance policies for wired and wireless networks.

Policy Enforcement Firewall with VPN (PEF-V) - Create a secure tunnel and allow your VPN (Virtual Private Network) traffic to enter the controller.

Advanced Cryptography (ACR) - Deliver military-grade cryptography and enable secure access to networks that handle controlled unclassified, confidential and classified information.

Instant Wireless Networks

Dell W-Series Instant Access Points (IAPs) combine enterprise capabilities with entry-level simplicity. These intelligent 802.11n devices have a built-in virtual controller and firewall, so they require no additional hardware or software. IAPs can be setup in about five minutes. Simply configure the first device and the other IAPs automatically form a unified cluster. You can add more capacity by simply plugging in more IAPs. The devices can even migrate to a controller-based platform to expand to a centralized wireless network.

Overview	Instant Models
Enterprise-level, 2x2 MIMO, dual radio (5GHz: 876Mbps, 2.4GHz: 450Mbps)	W-IAP204/W-IAP205
High-performance, 3x3 MIMO, dual radio (5GHz: 1.3Gbps, 2.4GHz: 450Mbps)	W-IAP214/W-IAP215
Latest Gigabit wireless 802.11ac, 3x3 MIMO, dual radio (5GHz: 1.3Gbps, 2.4GHz: 600Mbps)	W-IAP224*/W-IAP225
	W-IAP274/W-IAP275
High-performance, 3x3 MIMO, dual radio (450Mbps per radio) (W-IAP155: 2.4GHz: 300Mbps, 2x2 MIMO)	W-IAP155 ⊕ ϟ
	W-IAP134*/ W-IAP135
	W-IAP114*/W-IAP115
Mainstream, 2x2 MIMO, dual radio (300Mbps per radio)	W-IAP108*/W-IAP109 ⊕
	W-IAP104*/W-IAP105
	W-IAP175*● ϟ
Entry-level, 2x2 MIMO, dual radio (300Mbps per radio)	W-IAP103
Entry-level, 2x2 MIMO, single radio (2.4GHz: 300Mbps)	W-IAP3WN

⊕ **Wired + wireless models** are ideal for small offices, remote offices, teleworkers and road warriors requiring a secure tunnel to the corporate VPN. These models provide additional Ethernet ports to attach peripherals and options to power PoE devices. Small enough to sit on a desk or pack in a brief case, all models also include an additional USB port, offering you the ability to maintain a corporate VPN connection using a 3G/4G cellular modem.

ϟ Optional models supply PoE output (802.3af) to connected devices.

● Outdoor model

Guest Access and BYOD - ClearPass

The Dell ClearPass device is a highly integrated Access Management solution to manage all things BYOD. ClearPass connects to your existing network and can securely onboard devices, admit guest users, display device usage, perform health assessments and manage policies. ClearPass allows you to run one network for both guests and employees while maintaining appropriate security and service levels. The self-registration portal provided by ClearPass frees your IT staff from the manual setup process. Users simply connect to the WiFi network and ClearPass pushes appropriate security certificates to their devices.

Model [1]	Details
ClearPass 25,000	Up to 25,000 daily authenticating devices
ClearPass 5,000	Up to 5,000 daily authenticating devices
ClearPass 500	Up to 500 daily authenticating devices
ClearPass Modules	Licensing options: Guest, OnBoard, OnGuard for Advanced Policy Management

[1] ClearPass is available pre-loaded to a Dell server or as software only (Virtual machine for VMware™).

AirWave Network Management

Dell W-Series AirWave management software is an intuitive interface that delivers a consolidated view of the RF environment, controllers, APs and the infrastructure. AirWave can manage all Dell W-Series products and provide visibility and troubleshooting for your entire network, including support for many third-party devices.

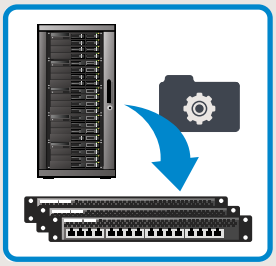
Flexible mounting kits, external antennas and AC adapters purchased separately.
* External antenna model designed for unique deployment scenarios.

Data center network automation

Open Automation
Embedded tools in the Dell Networking Operating System add intelligence and programmability

Dell Networking Open Automation framework provides an open standards-based automation solution for data center operations. The Open Automation Framework is an integrated software suite of network management tools that can be used together or independently. These tools provide data center managers with a complete set of capabilities required in today's dynamic, virtual data center environments.
(Functionality of Software OS v9.x)

Bare Metal Provisioning

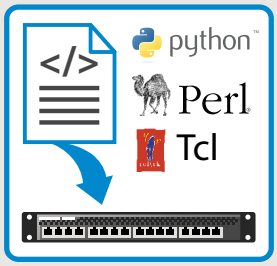


Automatically configure network switches

Switches automatically configure themselves by loading the configuration file & operating system

- Reduce installation time
- Enforce standard configurations
- Eliminate manual errors
- Simplify OS upgrades

Smart Scripting



Customize switches with familiar languages

Perl, Python or Tcl scripting environments for custom monitoring and management

- Increased network uptime
- Reduce time for problem resolution
- Improve configuration management & auditing

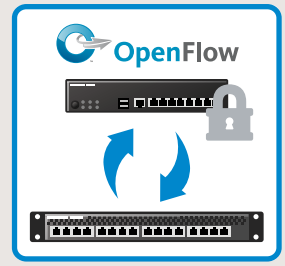
Virtual Server Networking

Automate VM and VLAN migration and provisioning

Hypervisor switch communications to ease Virtual Machine & Virtual LAN management

- Increase data center flexibility
- Maintain network connectivity & security with VM migration

Programmatic Management

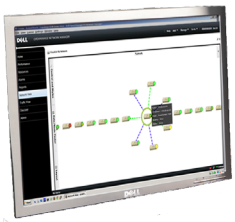


Gain the ability to manage switches with third-party tools

Seamless integration with programmatic interfaces & system management tools

- Simplify network management
- Minimize number of management tools
- Reduce OpEx

Network Management



Simplify the complex

As your infrastructure gets larger and more complex, it can be a real headache to keep track of every device in your network. You need to know the status of those devices, how they are performing, and have the ability to manage their configuration for optimal performance. With Dell you are able to regain control of the network with **OpenManage Network Manager**. View complete physical and logical inventories of your network, get detailed connectivity information of each device, and automate network functions. **Try it for free**. Information at **Dell.com/NetworkManager.**

Network Services

Whether you are seeking product support or complete IT outsourcing, Dell can deliver services based on your need. Get a free business consultation at **Dell.com/NetworkConsulting.**

Consulting services
Achieve improved business outcomes with professional guidance pertaining to your network. Improve network performance, add functionality, and leverage existing infrastructure to maximize your investment.

Deployment services
Let us install and correctly optimize your network with a comprehensive set of remote and onsite deployment services.

Managed services
Free yourself to focus on your business and allow Dell to fully manage and monitor your multi-vendor network with triage, resolution, and tier 2 and 3 engineering support.

Support Services*
Gain access to networking professionals 24 hours a day who help you configure, troubleshoot, and diagnose your network. Dell ProSupport™ experts also help resolve complex issues related to third-party connectivity to Cisco, Brocade, Juniper, HP, and Aruba.

*Availability and terms of Dell Services vary by region. For more information, visit **Dell.com/ServiceDescriptions**.

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